

# ERGONOMICS RISK ANALYSIS

Job Description: Pipette Use

**Evaluator:**

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## Awkward Postures

<b>Neck</b>	<input type="checkbox"/> No Problem Observed <input checked="" type="checkbox"/> Twisted (rotated) <input type="checkbox"/> Tilted Back <input checked="" type="checkbox"/> Tilted Forward <input checked="" type="checkbox"/> Lateral (bending side to side) <input type="checkbox"/> Other	<b>Specific Job Tasks:</b> Pipetting Writing on tubes Opening and closing caps	<b>Solutions:</b> Provide education Explore equipment options: document holders for reference materials and/or writing, tube openers/ closers, magnifying glasses, wide grip pens
<b>Wrist/Hand</b>	<input type="checkbox"/> No Problem Observed <input checked="" type="checkbox"/> Flexion <input checked="" type="checkbox"/> Ulnar Deviation <input checked="" type="checkbox"/> Extension <input checked="" type="checkbox"/> Radial Deviation <input checked="" type="checkbox"/> Excess Thumb Use	<b>Specific Job Tasks:</b> Pipetting Small writing on tubes Opening/ closing caps Use of vortex	<b>Solutions:</b> Provide education Provide wide grip pens Alternate hand use Choose appropriate tool for task Relocate equipment and supplies
<b>Elbows/Forearm</b>	<input type="checkbox"/> No Problem Observed <input checked="" type="checkbox"/> Flexed (arm bent up) <input checked="" type="checkbox"/> Extended (arm straight) <input checked="" type="checkbox"/> Winged (away from body) <input type="checkbox"/> Supination (palm up) <input type="checkbox"/> Pronation (palm down) <input checked="" type="checkbox"/> Sustained extension/flexion <input type="checkbox"/> Other	<b>Specific Job Tasks:</b> Pipetting Reaching for supplies Use of vortex	<b>Solutions:</b> Provide education Relocate equipment and supplies Explore equipment options: lazy susan
<b>Back</b>	<input checked="" type="checkbox"/> Forward Bending <input checked="" type="checkbox"/> Slouched <input checked="" type="checkbox"/> Inadequate Lumbar Support <input checked="" type="checkbox"/> Twisted <input checked="" type="checkbox"/> Static Standing	<b>Specific Job Tasks:</b> Pipetting	<b>Solutions:</b> Provide education Explore equipment options: anti-fatigue mats, ergonomic chairs/stools Relocate equipment and supplies
<b>Shoulders</b>	<input type="checkbox"/> No Problem Observed <input checked="" type="checkbox"/> Forward Reach <input type="checkbox"/> Reaching Behind <input type="checkbox"/> Raised shouldler height <input checked="" type="checkbox"/> Raised/chest height	<b>Specific Job Tasks:</b> Pipetting Reaching and disposing tips/caps/ tubes Reaching for vortex	<b>Solutions:</b> Provide education Relocate equipment and supplies Explore equipment options: adjustable height work stations
<b>Legs</b>	<input checked="" type="checkbox"/> Insufficient leg clearance <input checked="" type="checkbox"/> Stance	<b>Specific Job Tasks:</b> Prolonged standing	<b>Solutions:</b> Provide education

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	<input type="checkbox"/> Other	When sitting on lab stools noted inadequate thigh clearance and lack of back/foot support	Explore equipment options: anti-fatigue mats, ergonomic chairs/stools Explore environmental options: remove facing and/or drawers
<b>Other</b>	<input checked="" type="checkbox"/> Work surface height nonadjustable	Specific Job Tasks: Fixed counter heights	Solutions: Provide education Explore equipment options: adjustable workstations
<b>Repetitive Activities</b>		Specific Job Tasks: Grasping, reaching, use of thumb, pinching	Solutions: Provide education Explore equipment options: ergonomic chairs/stools Relocate equipment and supplies
<b>Static Postures</b>		Specific Job Tasks: Neck position, grasping, sitting, standing, pinching	Solutions: Provide education Explore equipment options: ergonomic chairs/stools, anti-fatigue mats
<b>Contact Stress/Pressure/Vibration</b>		Specific Job Tasks: Edge of work surface/ counter/bench Use of vortex	Solutions: Provide education Explore equipment options: edge padding Use of automatic vortex when possible
<b>Work Style/Flow</b>		Specific Job Tasks: Some tasks are time sensitive (example: incubation of cells), so must be done continuously. Can take self paced mini-breaks	Solutions: Provide education
<b>Environment</b> (organization , access, layout, hazards, lighting, temperature)		Specific Job Tasks: Accessing supplies and equipment	Solutions: Relocate supplies and equipment

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<b>Tools &amp; Equipment</b>	<p>Pipettes (different pipettes require different tips), Vortex, Plate Vortex, Thermocycler, Centraforce, disposal bins for used tips, caps, tips, tube opener/ closer tools</p> <p>Some scientists reported the ergonomic pipettes result in a loss of control/ precision</p>	<p>Various types of pipettes available including:  Pipette Man  Pipette Plus (one less thumb movement)  Electric single pipette (pistol handle)  Electric multiple channel pipette (8 or 12 channels)  Pipette Aid (long tube for large volume)  Rainin LTS (light touch system)  Eppendorf 500  Eppendorf 1000 (excess thumb pressure to expel tip)  Benchmate II by Nichiryo (autoclavable)</p>	<p>Solutions:  Eliminate Eppendorf 1000 as a choice since it is a high ergonomic risk (excessive thumb pressure to release tips)  Explore equipment options: pipettes  Education regarding various types of pipettes available  Use tube opening/ closing tools</p>

## Summary:

1. Provide education and/or training in the following areas: hand use, stretching, arm use, alternating hand use, mini-breaks/ posture changes, neutral posture, types of pipettes
2. Explore equipment options: document holders, wide grip pens, magnifying glass, pipette selection, lazy susan, adjustable height tables, anti-fatigue mats, ergonomic chairs/ stools, tube opener/ closer,
3. Explore environmental options: relocating supplies and equipment, removal of facing/ drawers of counters
4. Create a survey to identify individual workstation equipment and environmental needs
5. Do ergonomic evaluations at each of workers workstations. Create a needs survey to prioritize evaluations

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## Pipette Risk Analysis Photos



**Photo 1. Leg clearance.**

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**Photo 2. Pipette posture.**



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**Photo 3. Pipette posture using thumb.**

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**Photo 4. Writing on tubes.**